Advancing Sea Level Change Science with SWOT

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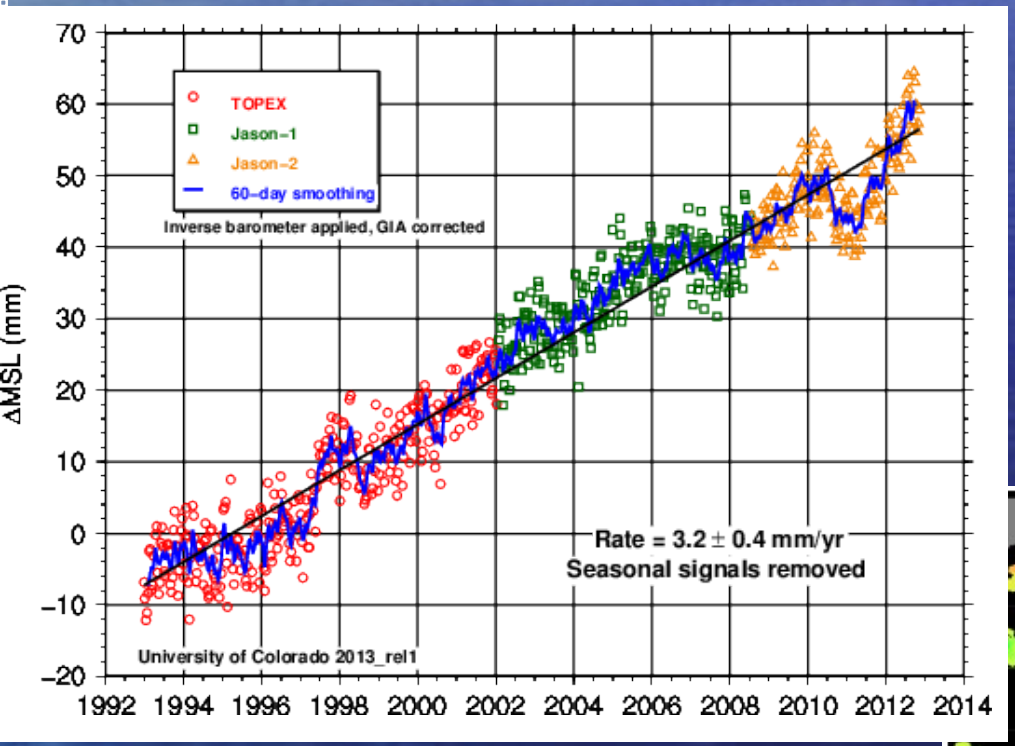
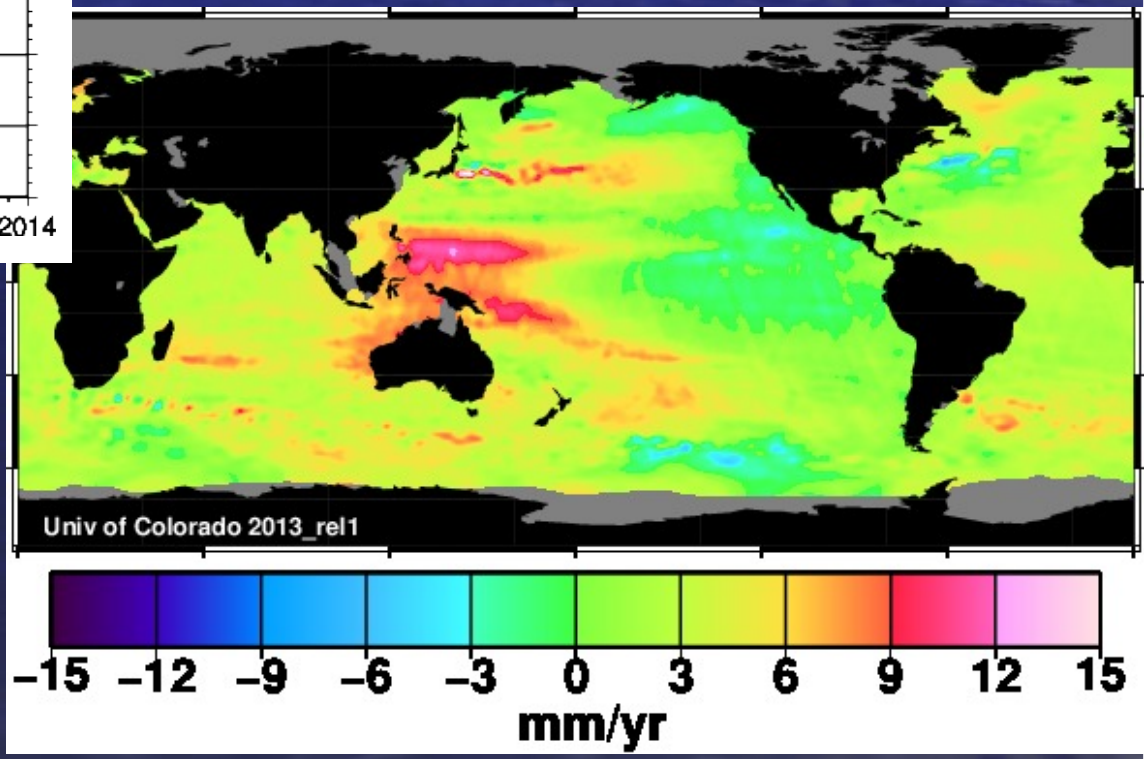


Global mean sea level change variations over the last 20 years

Regional sea level trends over the last 20 years



Measuring Sea Level Change

- SWOT can potentially continue and augment the GMSL climate record, densify the regional sea level record, and pioneer the coastal sea level record.
- The nominal SWOT inclination (78°) will provide coverage of the polar regions not currently covered by the reference altimeter missions (±66° - TOPEX, Jason-1, Jason-2).
- Regional sea level changes measured by SWOT in the polar regions can provide improved observability of the sea level fingerprints associated with ice sheet mass loss.
- SWOT has the potential to provide improved measurements of coastal sea level, which is critical for assessing the socio-economic impacts of sea level change.
- SWOT will help us understand the relation between sea level and terrestrial water cycle.

Our Contribution to the SWOT SDT

- We will work with the SDT to understand how SWOT might contribute to sea level change science.
- We will investigate how the SWOT wide-swath measurements might improve estimates of regional and coastal sea level change.
- We will develop approaches to calibrate and validate the SWOT nadir and wide-swath sea level measurements using comparisons to other altimeters, tide gauge data, etc.
- We will assess the ability of the tide gauge network for monitoring instrument drifts in the SWOT measurements.
- We will investigate other novel approaches to calibrate/ validate the wide-swath sea level measurements.
- We can assist with the design of the SWOT orbit as needed.

Phase A – SWOT Sea Level Issues

- For sea level science from the nadir altimeter (and for understanding cross-calibrations with other altimeter missions), it would still be desirable to have SWOT fly a ±1 km repeat orbit.
- For sea level science, we believe high-resolution data is desired for sea level studies in coastal regions, but probably not needed in the open ocean for sea level change studies.
- A high-level gridded sea level product would be desirable, including a gridded mean sea surface that incorporates the SWOT wide-swath data.
- The footprint of the radiometer and correctly assigning land flags will be crucial for coastal SSH measurements.
- Improved coastal tide and mean sea surface models will be essential.
- Validate with coastal tide gauges, AirSWOT, etc.